Chapter 12

Plan & Profile Sheets

12.1 Objectives

- Understand and be able to use the GEOPAK 2001 Plan & Profile Sheet Generator

12.2 Definitions

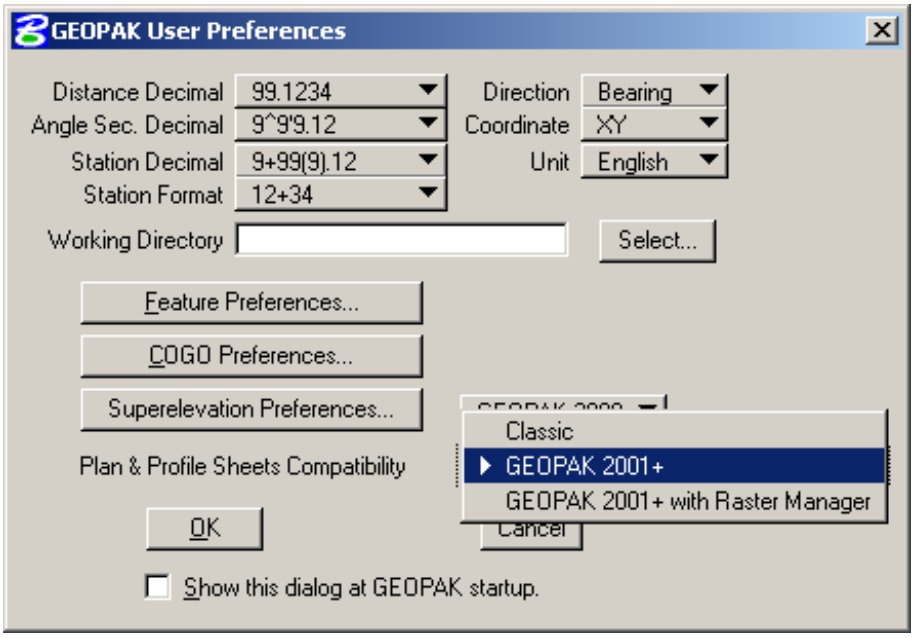
Based on user-defined parameters and sheet size, sheet borders will be placed into a design file relative to a specific alignment. Modifications may be made to sheet size and location. Once the sheet boundaries are in the proper location, the designer may then place the sheet(s) into a design file(s) with the appropriate reference files and sheet cell.

The CADD Support Center has set up a plan sheet library as a basis for generating typical plan and profile sheets. These plan sheet library includes all of the settings, which include General Settings, Plan Drawing Area, Profile Drawing Area, Grid Settings, Tabular Data, etc.

12.3 Accessing

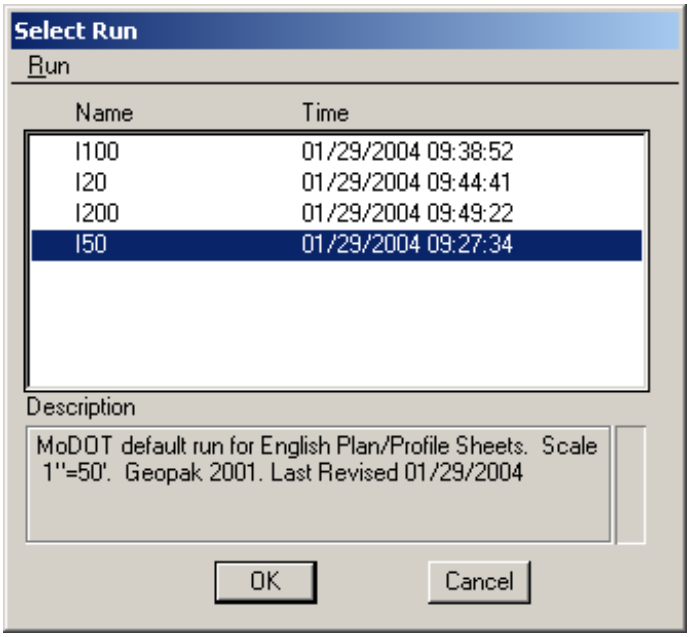
To be able to access the GEOPAK 2001 Plan/Profile Sheets, the Plan & Profile Sheets Compatibility will need to be switched to the **GEOPAK 2001+** in the GEOPAK User Preferences.

Applications >> GEOPAK Road >> User Preferences. The User Preferences dialog appears.



To make use of the MoDOT default runs, the Plan and Profile Sheets Generator must be invoked via the **Road Project** flow chart button **Plan & Profile Sheets** shown to the right.

When the button is pushed the **Plan & Profile Sheets Run Picker** dialog appears.



The user will copy the run that represents the scale in which he/she is interested. Each run is configure to minimize user input.

RUN NAME	DESCRIPTION
I100	English Sheet for a 1"=100' scale
I200	English Sheet for a 1"=200' scale
I50	English Sheet for a 1"=50' scale
I20	English Sheet for a 1"=20' scale

Upton entering a run, the Sheet Layout dialog appears. The sheet scale part of the dialog is automatically set for each default run.

12.4 Sheet Library

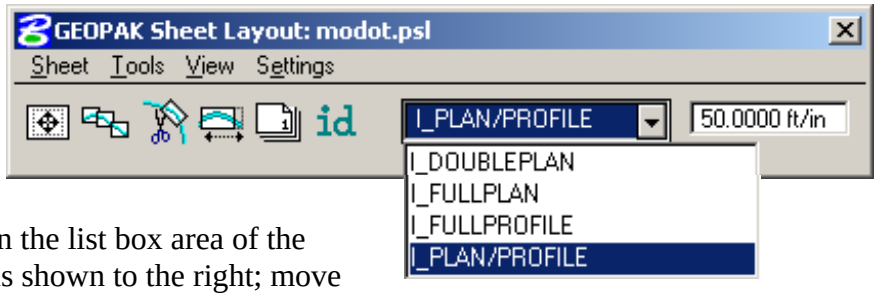
A sheet library must be attached to the current session. CADD Support has set up the tool so the MoDOT sheet library (modot.psl) is automatically attached.

The sheet library contains all the parameters required to layout and to clip the sheets. Only CADD Support is authorized to edit the MoDOT sheet library. Any other sheet libraries will not be supported.

12.5 Sheet Types

The sheet library contains four types of sheets. They are:

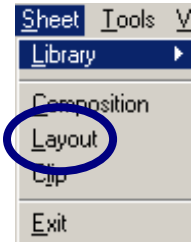
- Double Plan
- Full Plan
- Plan/Profile
- Full Profile



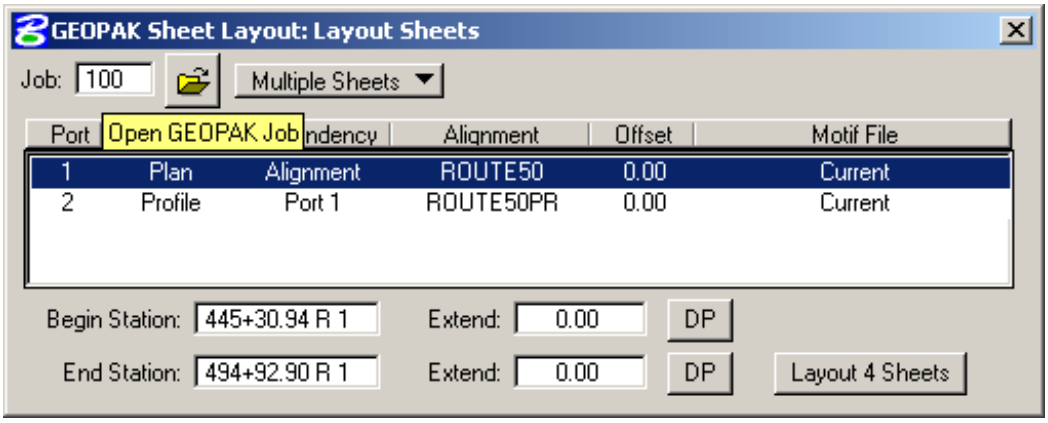
To select a sheet type, click in the list box area of the dialog, causing it to expand as shown to the right; move the cursor to the type of sheet desired; and click again.

12.6 Sheet Layout

Once the type of sheet has been selected, the user is ready to layout the sheets. The layout process can be accessed by selecting the layout icon from the dialog box or via the pull down menu **Sheet >> Layout**



The **Layout Sheets** dialog appears.



12.6.1 Job Number

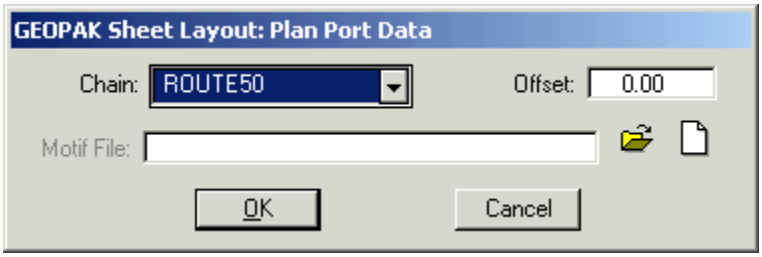
The user first needs to select the **Job** number by clicking in the open folder icon. Once the job number is selected, the user is ready to set up each port.

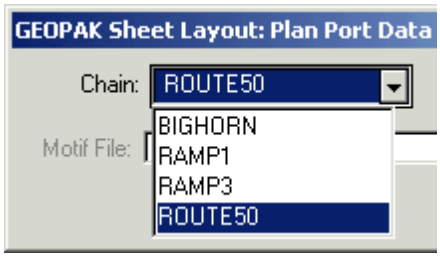
12.6.2 Ports

Depending on what type of sheet is selected, the user may have one or two ports. A port is typically a rectangular area that shows a particular section in a sheet, for instance, a standard plan and profile sheet contains two ports, one plan port and one profile port.

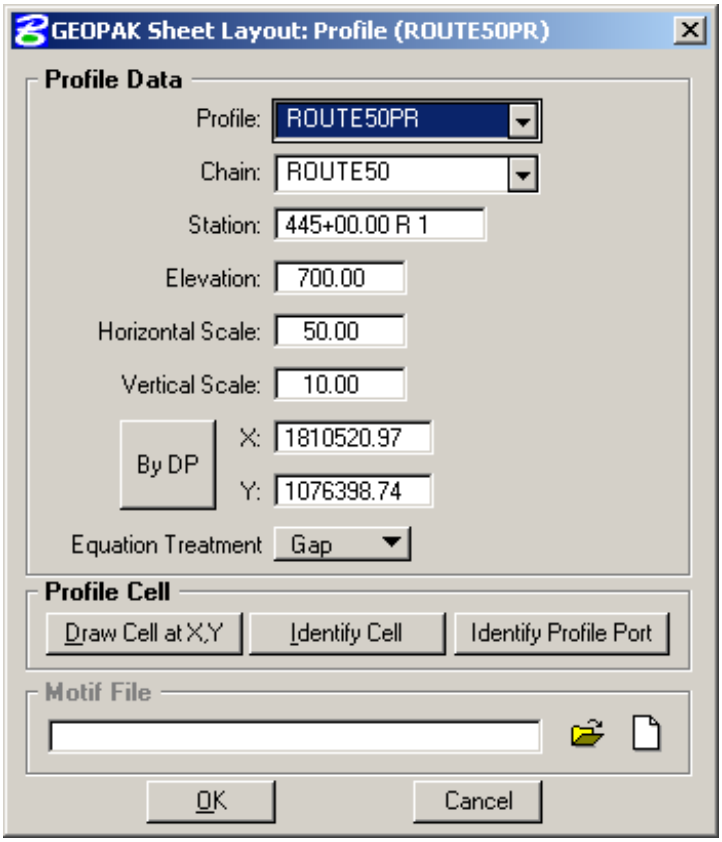
The job specific data for each port must be set. If there are two ports, it is important to enter the data for Port 1 first. Double click on a port to enter the data for the port.

If it is a plan type port the next dialog box appears. Select the chain via the pull down list box. Once the chain is selected, click the **OK** button.





If it is a profile port, the following dialog appears. The profile must be selected from the Profile list box.



The rest of the fields in the **Profile Data** area of the dialog can be filled in two ways. One way is to manual fill each of the field with the proper information. However, if a profile cell has been plotted for the alignment, the user can automatically populate the fields by clicking on the **Identify Cell** button and data pointing on the plotted cell. If a profile cell does not exist, the **Draw Cell at X, Y** can be used to place a profile cell once the information has been manually entered into the dialog.

The Profile Data fields contain the following information:

Station: station value of the data point used to define the location of the profile;
Elevation: elevation value of the data point used to define the location of the profile;
Horizontal Scale: horizontal scale of the plotted profile;
Vertical Scale: vertical scale of the plotted profile;
DP X: the X coordinate of the profile location; and
DP Y: the Y coordinate of the profile location.

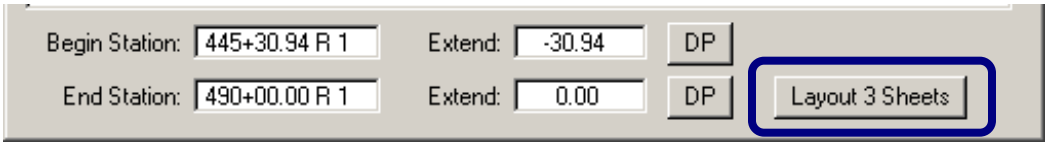
The X and Y coordinates can be typed in or set by choosing the **By DP** button and data pointing in the MicroStation drawing to set the origin point. If the profile has a station equation, the profile can be plotted with gaps or with no gaps.

Once the profile information populated, click on the **OK** button.

12.6.3 Station Range

The **Beginning Station** and **Ending Station** fields are automatically filled in with the station limits of the chain identified in the upper portion of this dialog box. Should the user want to begin or end at a different location the user has the option to type in the station limits for sheet processing or click the **DP** button and data point a location on the screen along the center line.

In addition, the user has the option to start the sheet layout before or after the beginning or end of the alignment by setting the appropriate values in the **Extend** field. A positive number moves in the direction of increased stationing, while a negative number moves in the direction of decreased stationing. For example, the values for the Begin Station shown below will cause the first sheet to start at station 445+00, 30.94 feet before the beginning of the chain.

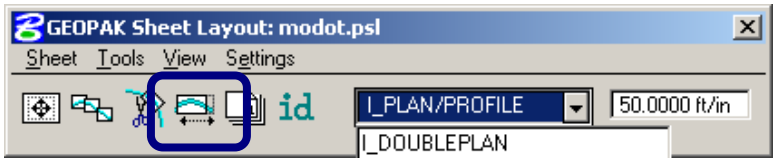


Based upon the begin and end station information the dialog will indicate how many sheets will be laid out as shown above. The user then selects the **Layout Sheets** button to layout the sheets.

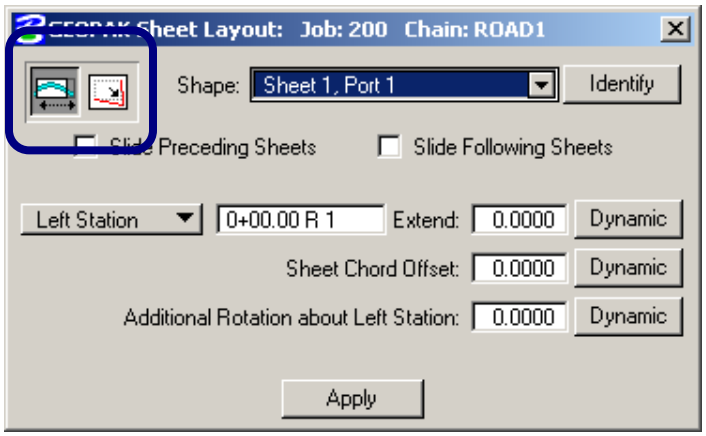
12.7 Modify

Once the above process is complete, the user should review the location of all the sheets to see if any modifications are needed.

To access the Modify mode, select the **Modify Sheets** icon or the menu path **Tools>>Modify**.

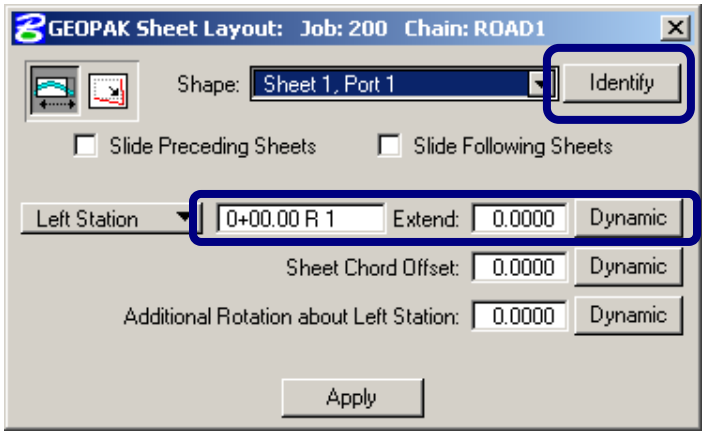


Two major modifications are supported and are selected via icon in the upper left corner of the dialog box shown below. The user has the options of **Slide Sheets** or **Modify Drawing Area.** As the modification type is selected, the dialog changes to reflect the selection.



Slide Sheets - slides previously placed sheets along the alignment; adjacent sheets can remain in their original location or be moved along.

First, the user needs to identify the port to be modified by either selecting it from the list of all shapes in the current set or by pressing the **Identify** button and graphically selecting the clipping shape for the port, which will automatically fill the **Shape**.



Next, determine whether only one sheet is to be modified or if the modification should be carried over to adjoining sheets. If the sheets preceding the current sheet are also to be moved, then activate the **Slide Preceding Sheets** toggle. If the sheets after the current sheet are to be moved

a corresponding amount as the original shape, activate the **Slide Following Sheets**. If all sheets should be adjusted the same as the original sheet, activate both the **Slide Preceding Sheets and Slide Following Sheets.**

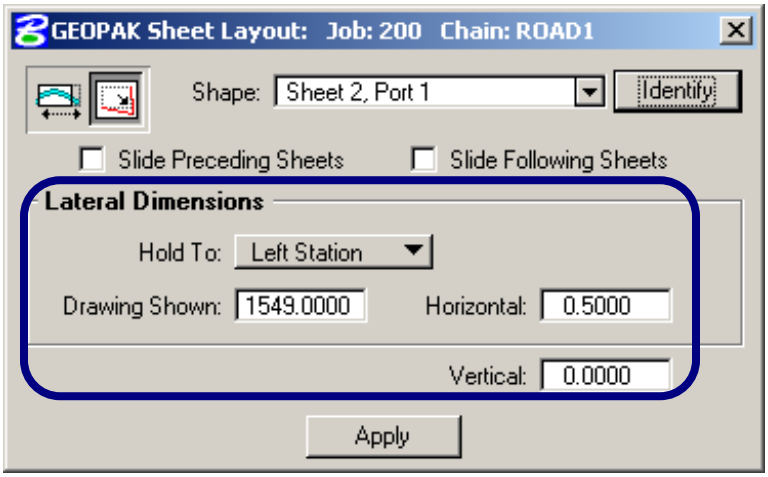
The sheets can be moved dynamically or by value. The station of the sheet is populated when the sheet was selected. To move the sheet along the alignment, enter the value (in terms of master units) in the **Extend** field or just enter the new station value. If entering a value in the **Extend** field, a positive number moves in the direction of increased stationing, while a negative number moves in the direction of decreased stationing.

To move dynamically, press the **Dynamic** button to the right of Extend, which attaches the sheet to the cursor. Then place a data point to initiate moving the cursor, noting the station and Extend values changing as you move. To stop the dynamics, place a final data point to identify the location and commence sliding.

To move the sheet further away (or closer to the alignment) without changing the stationing, use the **Sheet Chord Offset** using a value or dynamically

The **Rotation** can be entered as an angle or dynamically. Rotation always pivots about the left edge of the clipping shape. Rotation alone does not cause Preceding or Following sheets to slide.

Modify Drawing Area - modifies the Clip borders.



The sheet must be identified using the same procedure as the **Slide Sheets tool**. The **Slide Preceding** and **Following Sheets** is also supported.

When the sheet is identified, the fields in the **Lateral Dimensions** are automatically populated. The user has the option to hold the **Left Station**, the **Right Station** or the **Center Station**. Only one station can be held while the other two are adjusted to the revised drawing parameters. Set the desired values andpress the **Apply** button to commence redrawing.

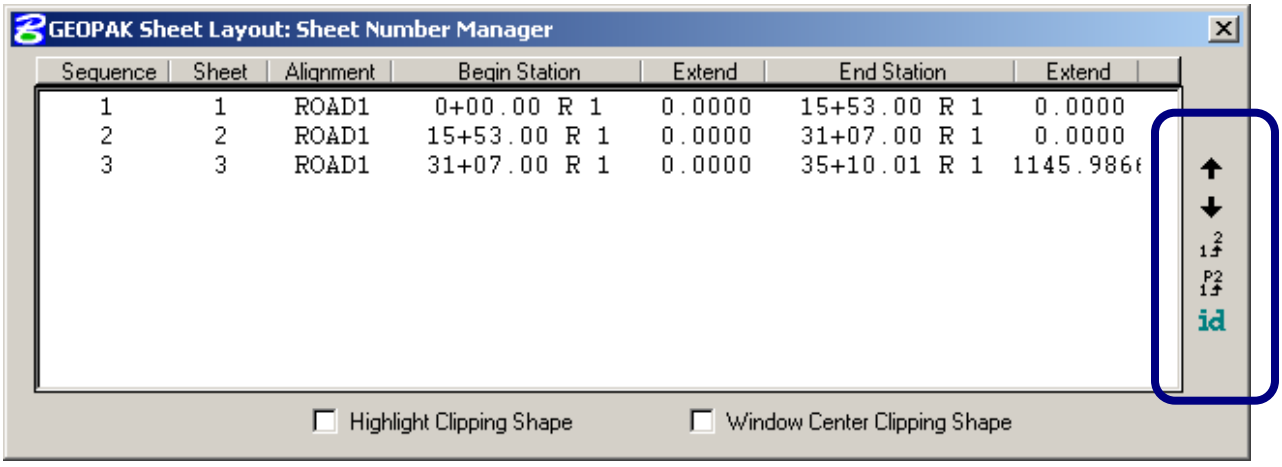
Note: There are no dynamic options when changing the drawing area.

12.8 Sheet Number Manager

Once the clipping shapes have been placed in the MicroStation drawing, the user can adjust the sequence of the sheets by using the **Sheet Number Manager**.

The Sheet Number Manager can be accessed via pull down **Tools >> Sheet Number Manager** or by selecting the icon on the dialog box.

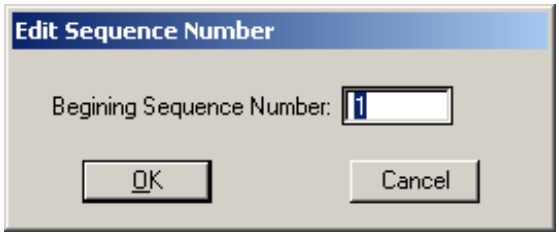
Once the tool is selected the dialog below appears.



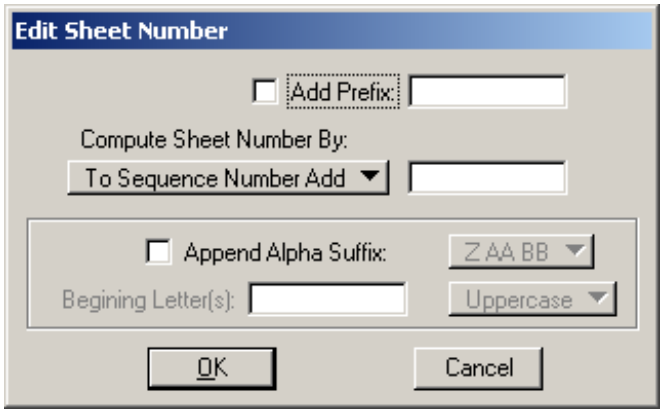
The dialog lists all the sheets in the order they will be drawn. By default the sequence of the sheets matches the sheet number. If the sequence of the sheets needs to be adjusted, the user can highlight the sheet and use the **up and down arrows** on the right hand side of the dialog.

The **id** icon allows the user to select a clip shape from the MicroStation file. The associated line in the list box is highlighted.

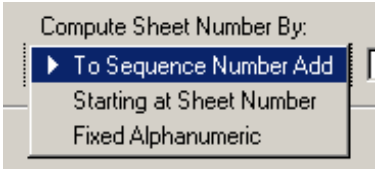
The **Edit Sequence** tool  may be used in the case that there are too many sheets to move with the arrows. Highlight the sheet to be moved and press the icon. **The Edit Sequence Number** dialog opens.



If for any reason the user needs to change the sheet numbers, the **Edit Sheet Numbers**  tool can be used. The user needs to highlight the sheets to be changed and press the **Edit Sheet Number** icon, which opens the dialog shown below.



The user has the option to add a prefix, append an alpha suffix, or do both. The sheet numbers can be edited by the options shown below:



To Sequence Number Add – It renumbers the sheet by adding a value to the original sheet number. For example, if the original sheet number was 1 and sequence add number is 100; the new sheet number becomes 101.

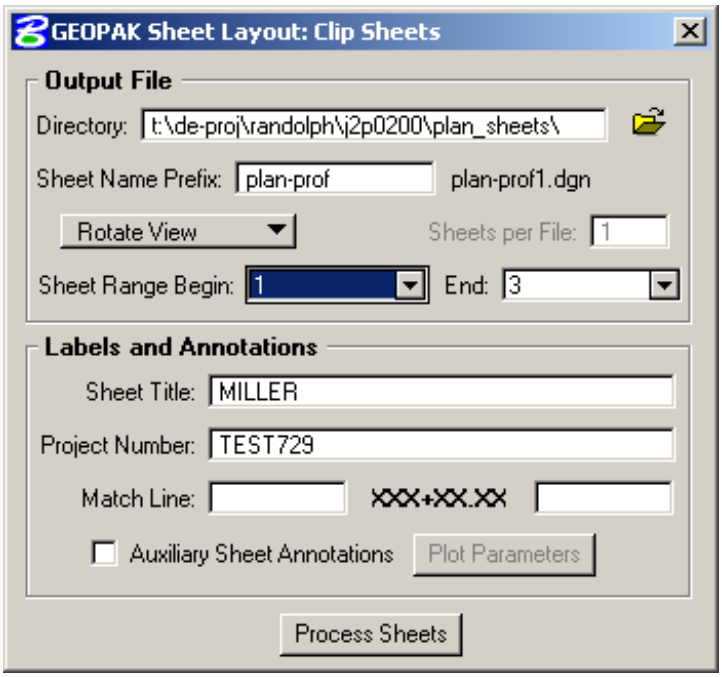
Starting at Sheet Number – The user specifies a given number from where to start.

Fixed Alphanumeric - This field is used in combination with the bottom entries in the dialog. The user specifies to hold a fixed alphanumeric value and toggles the **Append Alpha Suffix.**

12.9 Clip Sheets

The **Clip Sheets** process can be accessed via pull down **Sheet** >> **Clip** or by selecting the icon on the dialog box.

The following dialog appears.



12.9.1 Output File

Directory – Path to folder where the design file containing the sheet(s) will be placed.

Sheet Name Prefix – Name of the design file containing the sheet (s). GEOPAK will add a 1, 2, etc. to the end of each file name.

Rotate View - will attach all reference files and rotate the view to conform to the orientation of the sheet. This option allows true coordinates for the file. (Note: If **Rotate View** is used, tools such as Plan View Labeler, and DP Station and Offset can still be used.)

Rotate Reference - Will rotate each reference file to orient itself with the sheet. (Note: It is suggested to use the **Rotate View** mode.)

Sheets per File - Indicates how many sheets are drawn per design file. (Note: for **Rotate Reference** only)

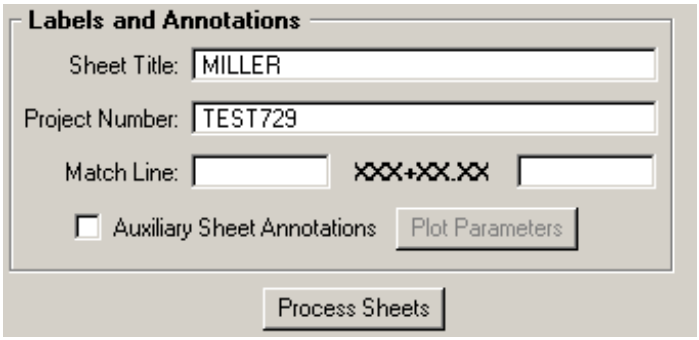
Sheet Range – Allows the user to choose which sheets to clip by selecting a **Begin** and **End** range.

12.9.2 Labels & Annotations

Sheet Title- CADD Support has set this field to be the name of the project county for a standard MoDOT sheet title block.

Match Lines – Will place a match line station.

Auxiliary Sheet Annotations – Will allow the user to add any other notes not already set in the default settings. Once the **Auxiliary Sheet Annotations** toggle is turned on, the Plot Parameters button will become available, and the user can define them accordingly.



Process Sheets - Once all the fields in the dialog box are entered, selecting the **Process Sheets**, initiates the sheet(s) creation.

12.10 Sheet Menu Options

Composition – Opens the sheet composition dialog box. It allows the user to define the drawing area. CADD Support has set up default settings for MoDOT users.

Layout – Opens the Layout sheet dialog.

Clip – Opens the Clip sheet dialog.

Exit – Exits the Plan/Profile Sheets application.

12.11 Tools

Modify – Opens the Modify sheet dialog

Sheet Number Manager – Opens the Sheet Number Manager.

12.12 Settings

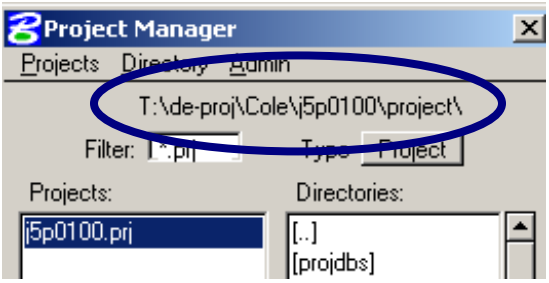
Sheet Layout – These settings allow the user to set up the Sheet Layout Progression, Profile Stair Stepping, and Sheet View Attributes.

12.13 Example 12-1

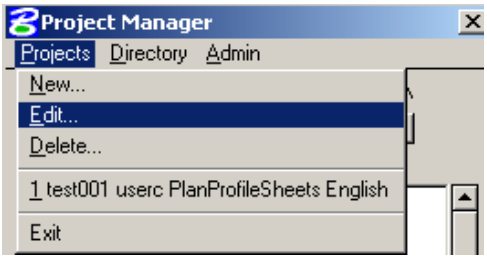
1. Open the MicroStation file **t:\de-proj\cole\j5p0100\data\rte_50plan_j5p0100.dgn**.

2. Attach the file **t:\de-proj\cole\j5p0100\data\profile_j5p0100.dgn as a reference file**.

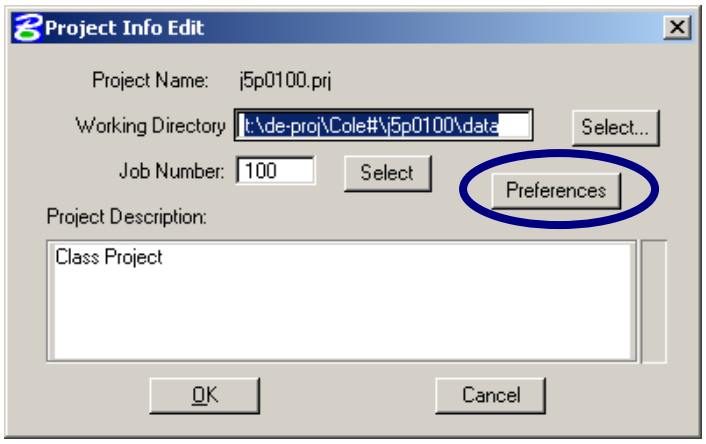
3. Select **Project Manager**, and navigate to the **j5p0100** project.



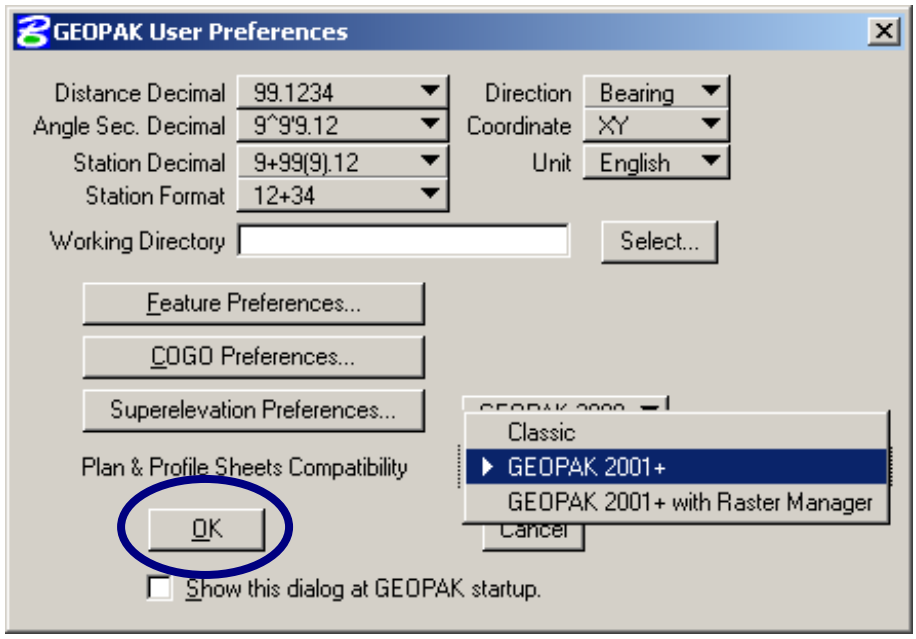
4. Select Projects >> Edit



Select Preferences



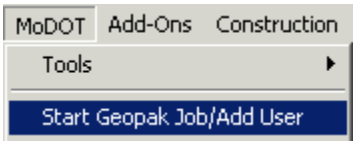
5. In the Geopak User Preferences, set the **Plan & Profile Sheets Compatibility** to **Geopak 2001+** as shown below.



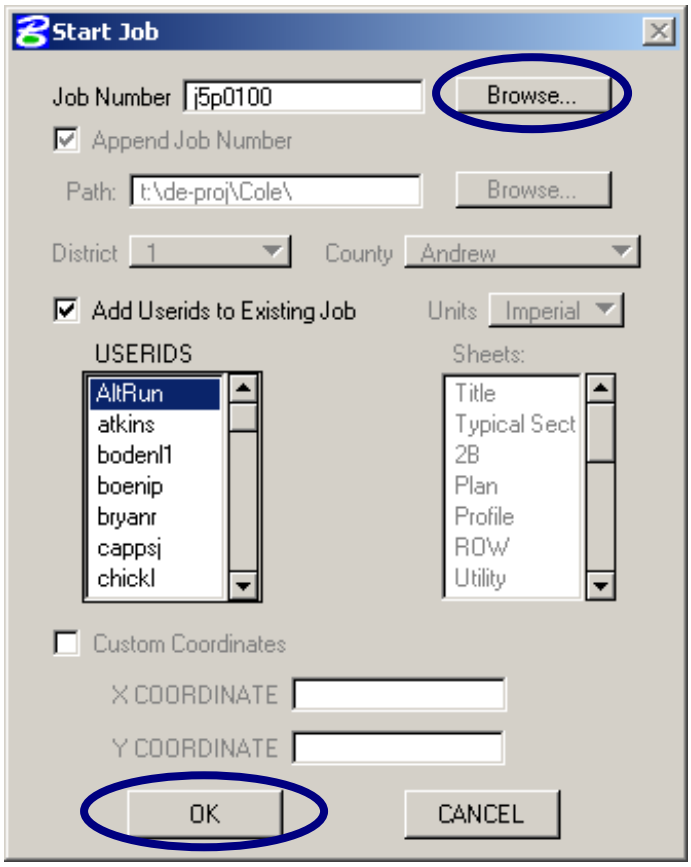
Select **OK**.

6. Enter the project, select **ClsUser**, an enter **Road**.

7. Select the **Start Geopak Job/Add User** tool from the MoDOT pull down menu to add user AltRun to the existing j5p0100 project.

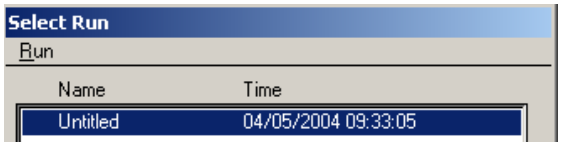


8. Check the **Add Userids to Existing Job** box. Click on the **Browse** button to navigate to the job folder. Select from USERIDS list **AltRun,** and click **OK**.

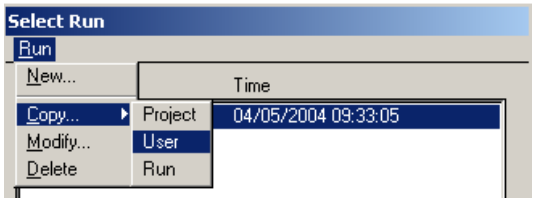


9. Select **Plan & Profile Sheets** from the **Road Project** flow chart

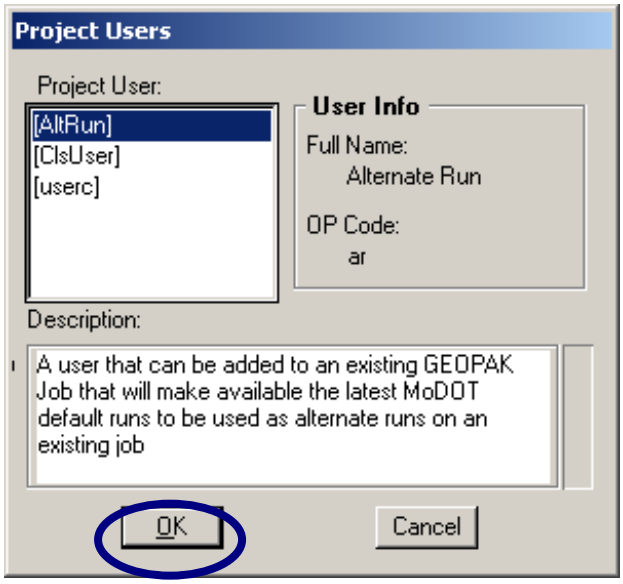
10. You will get an **Untitled** run as shown below. Delete the Untitled run.



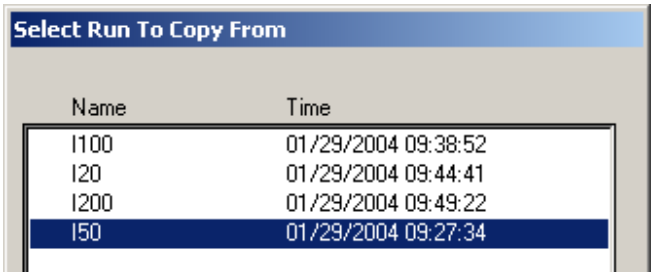
11. **Select Run >> Copy >> User**.



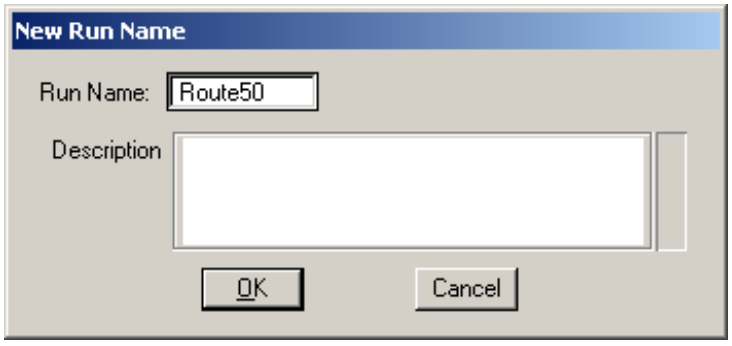
12. **Select** the **AltRun** user and click **OK**



13. Copy the **I50** run



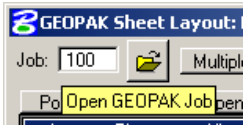
Name the new run **Route50**. Enter the new run.



14. Select the **Plan/Profile Sheet** from the pull down.

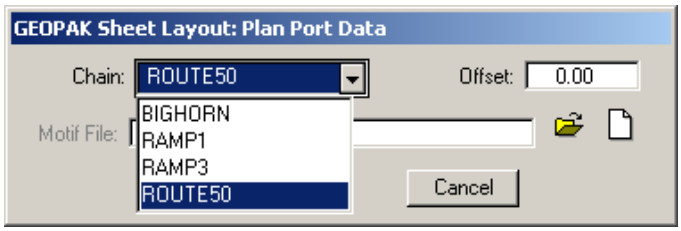
Select the **Layout Sheets** via icon as shown above or by pull down menu **Sheet>>Layout**.

15. Set up the **Layout Sheets** dialog with the information for the Route50 working alignment:

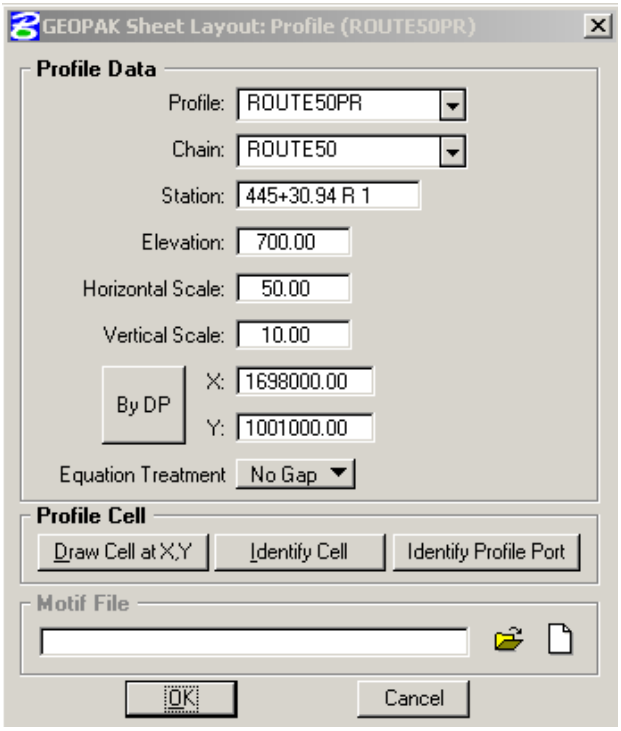


Select Job **100** by clicking on the open folder icon, as shown to the right.

Double click on **Port 1**. Select the **Route50** chain from pull down.

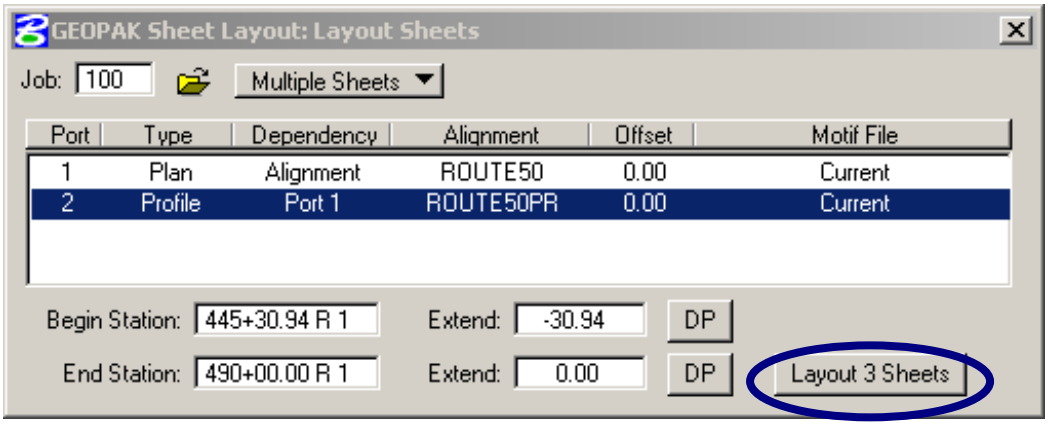


Double click on **Port 2**. Select the Profile **ROUTE50PR** and populate the rest of the dialog using the **Identify Cell**.



16. Once the ports are populated as shown below, enter the following:

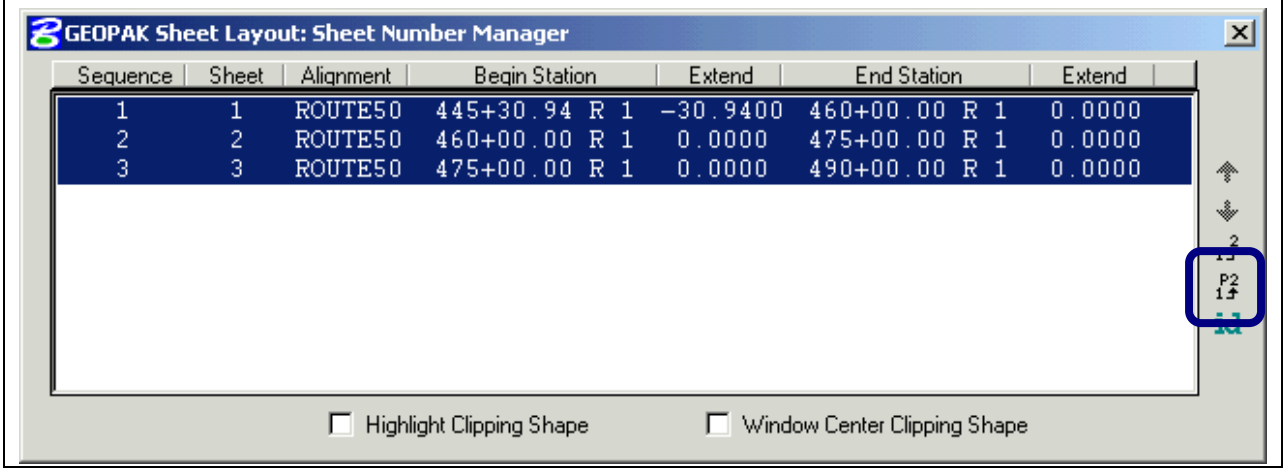
Begin Station **445+30.94 R1** Extend: **-30.94**
End Station **490+00.00 R1**



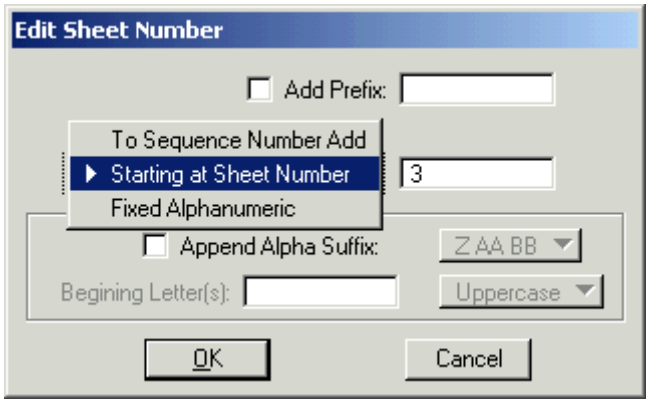
Once the dialog is completed as shown above, select the **Layout Sheets** button.

17. Select the **Sheet Number Manager** icon outlined below.

Highlight the three sheets in the Sheet Number Manager, a shown below. Click on the **Edit Sheet Number** icon outlined in the figure.



17. (Continued) Change the Compute Sheet Number By: option to **Starting at Sheet Number** and set its value to **3**, as indicated in the following figure.

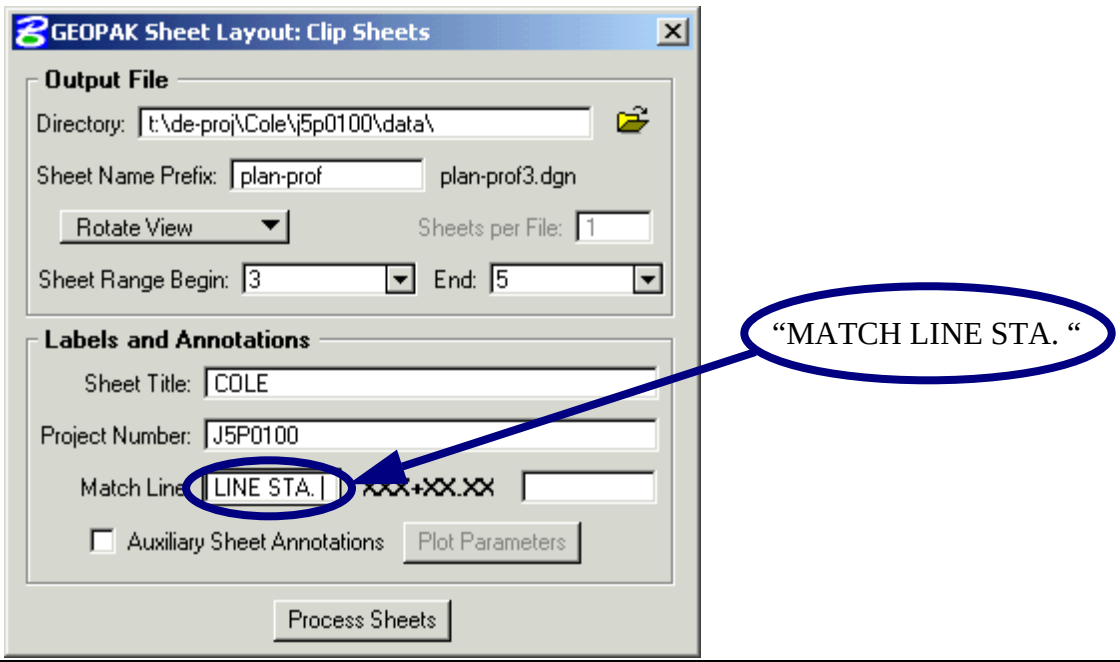


Click **OK** to change the sheet number and **close** the **Sheet Number Manager**. Save the changes.

18. Go to the **MicroStation** pull down **Workspace >> Preferences**. In the **Operations** section of the dialog check on **Immediately Save Design Changes**.

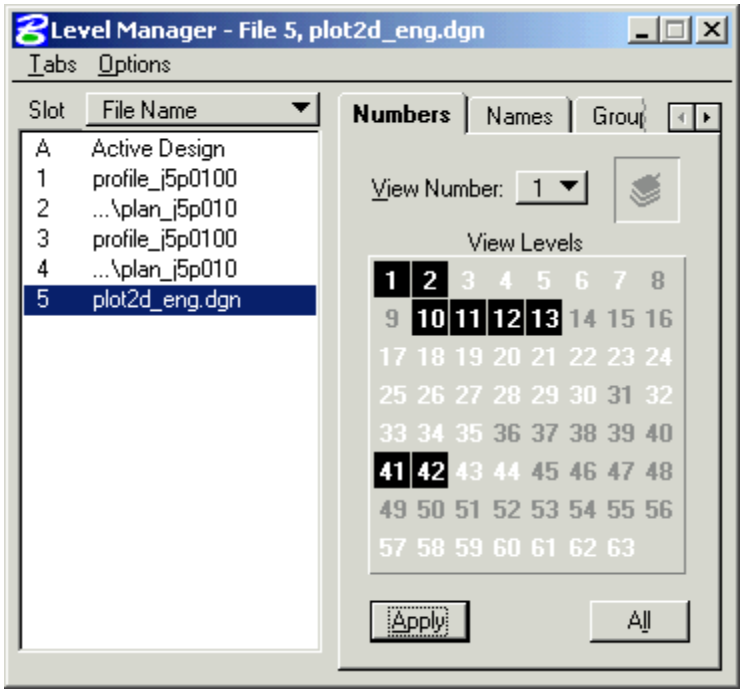
19. Select the **Clip Sheets** icon or via pull down menu **Sheet >> Clip** and set up

Populate the Clip Sheets dialog as shown below (The text "**MATCH LINE STA.**" goes in the Match Line field) and select **Process Sheets**.



20. Use the MicroStation **Level Manager** and **Reference** tools to clean up the sheets.

21. Using the **Level Manager**, turn on Levels **41** and **42** in the **plot2d_eng.dgn** reference file to see the grid for the profile port.



22. Go back to **Workspace >> Preferences >> Operations** and uncheck **Immediately Save Design Changes**.